CLAIMS

1. Method for supplying a pressurized gas by vaporization of a cryogenic liquid from at least two cryogenic separation units (A,B,C,D), the or each unit comprising a heat exchanger (1) and a system of columns (2,3), in which, in each separation unit,

a) a gas mixture compressed and purified in the heat exchanger is cooled to produce a compressed, purified and cooled gas mixture,

b) the compressed, purified and cooled gas mixture is separated in the system of columns,

c) a cryogenic liquid is withdrawn from the system of columns, and, in a first operating mode, a first portion (4,9) of the pressurized cryogenic liquid is vaporized in the heat exchanger to supply a portion of the pressurized gas, and

d) the pressurized gas is supplied from each unit,

and in which, according to the first operating mode:

e) a second portion of the cryogenic liquids from each cryogenic separation unit is sent to a common storage facility (12), and

f) cryogenic liquid from the storage facility is sent to each heat exchanger to be vaporized therein.

2. Method according to Claim 1, in which the second portion of the cryogenic liquid is not pressurized upstream of the storage facility and/or the first portion of the cryogenic liquid is pressurized upstream of the heat exchanger (1) for the or each cryogenic separation unit.

3. Method according to Claim 1 or 2, in which, in a first operating mode, cryogenic liquid from the storage facility (12) is sent to the heat exchanger (1) of at least one cryogenic separation unit (A,B,C,D), preferably to the heat exchanger of at least two cryogenic separation units, and the cryogenic liquid is vaporized in this heat exchanger (these heat exchangers) to supply a portion of the pressurized gas (10).

4. Method according to Claim 3, in which the cryogenic liquid is pressurized downstream of the common storage facility (12) and upstream of the heat exchanger (1).

5. Method according to one of the preceding claims, in which, in case of shutdown of a cryogenic separation unit, according to a second operating mode, the common storage facility (12) supplies a common vaporizer (34), preferably after a pressurization step, in which the cryogenic

liquid from the common storage facility is vaporized by heat exchange with a heating liquid to supply all or a portion of the pressurized gas.

6. Method according to Claim 5, in which the cryogenic liquid vaporized in the common vaporizer (34) only comes from the common storage facility (12).

7. Method according to one of the preceding claims, in which, in each cryogenic separation unit, the entire gas mixture intended for separation is cooled in the heat exchanger by heat exchange with at least one cryogenic liquid and at least one gas from the system of columns.

8. Method according to one of the preceding claims in which the first portion of cryogenic liquid (4,9) is pressurized by means of at least one pump (7,8) and, according to a third operating mode, in case of shutdown of at least one of the pumps of a cryogenic separation unit, in order to compensate for the loss of compressed liquid due to the shutdown of this pump, the second portion of the cryogenic liquid sent to the storage facility (12) is increased compared with the flow when the pump is running, and in the case in which one pump of the unit remains in working order, the flow rate of cryogenic liquid from the system of columns and sent to the heat exchanger (1) of this cryogenic separation unit is increased in comparison with the flow rate when the pump is running.

9. Method according to Claim 8, in which, in case of shutdown of at least one pump (7,8) of a cryogenic separation unit (A), the first portion of the cryogenic liquid is increased in comparison with the flow when the pump is running for at least one other air separation unit (B,C,D) of which the pump or pumps is/are running and the second portion of the cryogenic liquid sent to the storage facility is reduced in comparison with the flow when the pump is running for at least one other air separation unit (B,C,D) of which the pump(s) is/are running.

10. Method according to one of the preceding claims, in which, in case of shutdown of a cryogenic separation unit (A), the second portion of the cryogenic liquid sent from at least one cryogenic separation unit (B,C,D) to the storage facility (12) is reduced in comparison with the flow rate when the unit (A) is running, preferably to zero, the first portion of the cryogenic liquid sent to the heat exchanger is increased in comparison with the flow when the unit (A) is running for at least one cryogenic separation unit remaining in operation.

11. Method according to one of the preceding claims, in which, only in case of shutdown of at least one cryogenic separation unit, cryogenic liquid is sent from the storage facility (12) to an emergency vaporizer (34).

12. Installation for supplying a pressurized gas by vaporization of a cryogenic liquid from at least one cryogenic separation unit (A,B,C,D), the or each unit comprising a heat exchanger (1) and a system of columns (2,3) comprising, in each cryogenic separation unit:

a) means for sending a compressed and purified gas mixture to the heat exchanger to produce a compressed, purified and cooled gas mixture;

b) means for sending the compressed, purified and cooled gas mixture to the system of columns;

c) means (4) for withdrawing a cryogenic liquid from the system of columns, and means for sending at least a first portion (4,9) of the pressurized cryogenic liquid to the heat exchanger to supply a portion of the pressurized gas;

d) if applicable, means for mixing the pressurized gas (10) from at least two cryogenic separation units to supply the pressurized gas;

the installation further comprising a common storage facility (12) and means for sending a second portion (5,30) of the cryogenic liquid from the cryogenic separation units to the common storage facility, and means for sending cryogenic liquid from the storage facility to the heat exchanger of each cryogenic separation unit.

13. Installation according to Claim 12, not comprising any pressurizing means downstream of the system of columns (2,3) and upstream of the common storage facility (12).

14. Installation according to Claim 12 or 13, comprising a pressurizing means (7,8) downstream of the system of columns and upstream of the heat exchanger.

15. Installation according to Claim 12, 13 or 14, comprising means for sending cryogenic liquid from the common storage facility (12) to the heat exchanger (1) of at least one cryogenic separation unit.

16. Installation according to Claim 15, comprising means (20,22) for pressurizing the cryogenic liquid downstream of the common storage facility and upstream of the heat exchanger.

17. Installation according to one of Claims 10 to 16, comprising a common vaporizer (34), means for supplying the common vaporizer from the common storage facility (12), preferably pressurizing means (20,22) downstream of the common storage facility and upstream of the common

vaporizer and means for permitting heat exchange with a heating fluid and the cryogenic liquid in the vaporizer.

18. Installation according to Claims 16 and 17, in which the same pressurizing means (20,22) are connected downstream of the common storage facility (12) and upstream of the common vaporizer (34) and to at least one heat exchanger (1) of a cryogenic separation unit.

19. Installation according to Claim 17 or 18, in which the cryogenic liquid vaporized in the common vaporizer (34) is only obtained from the common storage facility (12).

20. Installation according to one of Claims 12 to 19, comprising, for the or each cryogenic separation unit, a cryogenic liquid line (9) connecting the system of columns (2,3) with the heat exchanger without passing through the common storage facility (12), and a cryogenic liquid line (6) connecting the system of columns and the heat exchanger via the common storage facility.

21. Installation according to one of Claims 12 to 20, comprising means for regulating the flow rates of liquid sent from at least one or each cryogenic separation unit to the common storage facility and/or means for regulating the flow rates of liquid sent from the common storage facility to the heat exchanger of at least one of the cryogenic separation units.